

CLAIMS

What is claimed is:

1. A semiconductor device structure, comprising:
a first layer comprising anti-reflective material; and
a second layer comprising silicon nitride, located over said first layer, and including at most about $1\frac{1}{4}$ in-film particles per square millimeter of surface area.
2. The semiconductor device structure of claim 1, wherein said anti-reflective material comprises silicon atoms and nitrogen atoms.
3. The semiconductor device structure of claim 2, wherein said anti-reflective material further comprises oxygen atoms.
4. The semiconductor device structure of claim 1, wherein said anti-reflective material comprises $\text{Si}_{\text{sub.x}}\text{O}_{\text{sub.y}}\text{N}_{\text{sub.z}}$, where x equals about 0.40 to about 0.65 times the sum of x, y, and z, y equals about 0.02 to about 0.56 times the sum of x, y, and z, and z equals about 0.05 to about 0.33 times the sum of x, y, and z.
5. The semiconductor device structure of claim 1, wherein a surface of said first layer is substantially free of at least one of measurable particulates and surface roughness.
6. The semiconductor device structure of claim 1, wherein said second layer includes at most about $1\frac{1}{4}$ of at least one of particles and surface roughness features of at least about 120 nm dimension per square millimeter of surface area.
7. The semiconductor device structure of claim 1, wherein said second layer is formed on said first layer.

8. A semiconductor device structure, comprising:
a first layer comprising anti-reflective material; and
a second layer comprising silicon nitride, located over said first layer, and including at most about $1\frac{1}{4}$ in-film particles per square millimeter of surface area.
9. The semiconductor device structure of claim 8, wherein said anti-reflective material comprises silicon atoms and nitrogen atoms.
10. The semiconductor device structure of claim 9, wherein said anti-reflective material further comprises oxygen atoms.
11. The semiconductor device structure of claim 8, wherein said anti-reflective material comprises $\text{Si}_{\text{sub.x}}\text{O}_{\text{sub.y}}\text{N}_{\text{sub.z}}$, where x equals about 0.40 to about 0.65 times the sum of x, y, and z, y equals about 0.02 to about 0.56 times the sum of x, y, and z, and z equals about 0.05 to about 0.33 times the sum of x, y, and z.
12. The semiconductor device structure of claim 8, wherein a surface of said first layer is substantially free of at least one of measurable particulates and surface roughness.
13. The semiconductor device structure of claim 8, wherein said second layer includes at most about $1\frac{1}{4}$ of at least one of particles and surface roughness features of at least about 120 nm dimension per square millimeter of surface area.
14. The semiconductor device structure of claim 8, wherein said second layer is formed on said first layer.